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(19)



## (54) A PUSH-TYPE FILTERING CENTRIFUGE

(71) We, DE DIEDRICH & CIE, S.A., of Niederbronn-les-Bains, Bas-Rhin, France, a French Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a push-type filtering centrifuge of the kind (herein called "the kind defined") comprising a rotary drum assembly, an inlet pipe for introducing mixture to be treated into the drum assembly at a position on the axis of rotation of the drum assembly, impervious truncated cones in the drum assembly for causing introduced mixture to follow a zig-zag course from the said position towards the periphery of the drum assembly, at least one filter sleeve, and an axially-reciprocating pusher assembly for pushing filter cake along the filter sleeve or sleeves in the axial direction.

Centrifuges of the kind defined are often used to treat large quantities of mixtures, some of which may comprise hot mother liquors giving off capours which can attack bearings or other mechanical components or react with bearing lubricants to cause damage.

The invention is intended to facilitate the provision of a centrifuge of the kind defined which can be constructed and arranged to achieve various desirable objects during manufacture or in operation.

According to the invention a centrifuge of the kind defined is characterised in that the drum assembly comprises an impervious conical wall surrounding the said cones and the filter sleeve or sleeves, the said cones are arranged in a series so that the mixture is accelerated in rotation from its entry at the said position until it leaves the outermost of the said cones and arrives on the filter sleeve or the first of the filter sleeves with substantially the same speed of rotation as the filter sleeve on which it arrives, there is a collector for the collection and discharge of filtrate which leaves the

conical wall at the largest diameter thereof, there is a collector for the collection and discharge of filter cake dislodged from the filter sleeve or one of the filter sleeves, and there is a protective casing surrounding the impervious conical wall.

How the invention may be put into practice appears from the following description with reference to the accompanying drawings, in which four centrifuges embodying the invention are illustrated diagrammatically and by way of example in four half-views in longitudinal section; in the drawings:—

Figure 1 represents in the upper half-view a centrifuge with a single filter sleeve, and in the lower half-view a centrifuge with two filter sleeves; and

Figure 2 also represents in the upper half-view a centrifuge with a single filter sleeve, and in the lower half-view a centrifuge with two filter sleeves.

Each of the centrifuges illustrated in Figure 1 and the upper half of Figure 2 is of the kind defined and comprises a rotary drum assembly, and an inlet pipe 6 for introducing mixture to be treated into the drum assembly at a position on the axis of rotation of the drum assembly. In the drum assembly are impervious truncated cones 7, 8 and 9 for causing introduced mixture to follow a zig-zag course from the said position towards the periphery of the drum assembly. There is at least one filter sleeve 1 in the drum assembly, and there is also an axially-reciprocating pusher assembly 2 for pushing filter cake along the filter sleeve or sleeves 1 in the axial direction.

The said drum assembly comprises the sleeve or sleeves 1, the pusher assembly 2, the cones 7 and 8 and 9, and an impervious conical wall 3 surrounding the said cones and the sleeve or sleeves 1.

The said pusher assembly comprises a solid central shaft to which are secured the cones 7, 8 and 9. These cones are arranged in a series so that the mixture is accelerated in rotation from

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its entry at the said position until it leaves the outermost of the cones and arrives on the filter sleeve 1 or the first of the sleeves 1 with substantially the same speed of rotation as the filter sleeve 1 on which it arrives.

5 A collector 4 is provided for the collection and discharge of filtrate which leaves the wall/3 at the largest diameter thereof in a zone 11, and there is a collector 5 for the collection and  
10 discharge of filter cake dislodged from the filter sleeve 1 or the last of the sleeves 1.

A protective casing 10 surrounds the wall 3 and encloses a space 13, and there may be means (not shown) whereby the space 13 can  
15 be filled with nitrogen or other inert gas, or the space 13 may be subjected to super-atmospheric or sub-atmospheric internal pressure or to a circulation of live steam at low pressure for sterilisation.

20 The wall 3 is secured to a hollow shaft mounted in bearings, of which that bearing 12 nearest to the zone 11 is well spaced from the zone 11; moreover the flow of filtrate at the zone 11 produces an aspiration effect in the  
25 space 13, and thereby vapours are entrained and are unlikely to reach and attack the bearing 12 or its lubricant.

Pipes (not shown) can project into the interior of the drum assembly for washing the  
30 filter cake, and other modifications may be made.

As shown in each of the two lower half-views the pusher assembly 2 comprises a portion which surrounds the first of the two filter  
35 sleeves 1 and guides the filtrate therefrom on to the wall 3.

The centrifuge shown in the lower half-view in Figure 2 is similar in many respects to that shown in the lower half-view of Figure 1 except

that there is no cone outside the cone 8, which delivers accelerated mixture on to the first of the sleeves 1.

#### WHAT WE CLAIM IS:—

1. A push-type filtering centrifuge of the kind defined, characterised in that the drum assembly (1, 2, 3, 7, 8, 9) comprises an  
45 impervious conical wall (3) surrounding the said cones (7, 8, 9) and the filter sleeve or sleeves (1), the said cones (7, 8, 9) are arranged in a series so that the mixture is accelerated in rotation from its entry at the said position until it leaves the outermost (9 or 8) of the said  
50 cones (7, 8, 9) and arrives on the filter sleeve (1) or the first of the filter sleeves (1) with substantially the same speed of rotation as the filter sleeve (1) on which it arrives, there is a collector (4) for the collection and discharge of filtrate which leaves the conical wall (3) at the  
55 largest diameter thereof, there is a collector (5) for the collection and discharge of filter cake dislodged from the filter sleeve (1) or one of the filter sleeves (1), and there is a protective casing (10) surrounding the impervious conical wall (3).

2. A centrifuge according to claim 1, comprising means whereby a space (13) in the casing (10) can be filled with nitrogen or other inert gas or with steam or be subjected to a pressure above or below atmospheric pressure.

3. A filtering centrifuge constructed and arranged substantially as hereinbefore described with reference to and as illustrated in any one of the four half-views in the accompanying drawings.

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Fig. 1

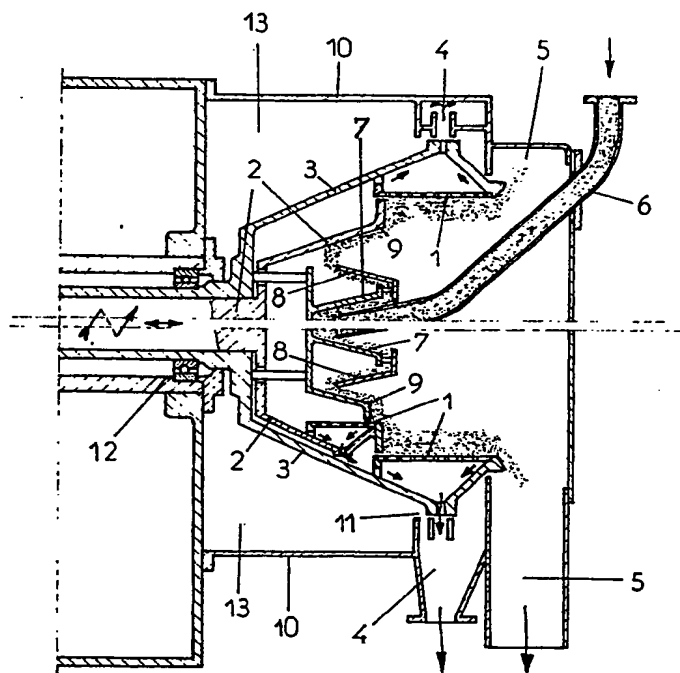


Fig. 2

